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ABSTRACT

This paper estimates peer effects by taking advantage of random assignment of first-year roommates through a housing lottery at a large state university. Preliminary results show that, when compared with white students who have white roommates, white students with black roommates express much more positive attitudes regarding affirmative action policies 1.5-3.5 years after college entry. Whites assigned minority roommates are also more likely to say that they have more personal contact with and interact more comfortably with members of minority groups. Minority roommates appear just as likely as non-minority roommates to remain close friends of white students beyond their initial year. Whites' income redistribution attitudes do not appear to be affected by the racial/ethnic composition of roommates, but whites become less supportive of redistributive policies when they are assigned roommates from wealthy families. Taken together, these results suggest that students become more sympathetic to the social groups to which roommates belong. (Contains 18 references.) (SM)

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Empathy or Antipathy? The Consequences of Racially and Socially Diverse Peers on Attitudes and Behaviors

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Abstract

This paper estimates peer effects by taking advantage of random assignment of first-year roommates through a housing lottery at a large state university. Our preliminary results show that, when compared with white students who have white roommates, white students with black roommates express much more positive attitudes regarding affirmative action policies 1½- 3½ years after college entry. Whites assigned minority roommates are also more likely to say that they have more personal contact with and interact more comfortably with members of minority groups. Minority roommates appear just as likely as non-minority roommates to remain close friends of white students beyond their initial year. Whites' income redistribution attitudes do not appear to be affected by the racial/ethnic composition of roommates, but whites become less supportive of redistributive policies when they are assigned roommates from wealthy families. Taken together, these results suggest that students become more sympathetic to the social groups to which roommates belong.

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Empathy or Antipathy? The Consequences of Racially and Socially Diverse Peers on Attitudes and Behaviors

I. INTRODUCTION

Do racial attitudes change when individuals of different races live or work together? Do people become more tolerant towards people of other races if they live with someone of a different race? Some previous studies based on laboratory experiments suggest that mixing people of different racial backgrounds does not necessarily change racial attitudes, but when people of different races work together toward the same goal, racial attitudes change. This paper addresses this issue in a less artificial context by examining whether racial attitudes change when people of different races are randomly assigned to live together at the start of their first year of college.

The impacts of mixing students from different races and ethnic groups have obvious policy relevance. Affirmative-action policies directed at increasing minority, especially black, student enrollment are highly controversial. Thernstrom and Thernstrom (1997) argue that policies that admit minority students with lower test scores reinforce stereotypes and ultimately hurt minorities. But Gurin (2002) argues that diversity promotes critical thinking and learning among white students.

A major methodological problem in assessing the extent to which individuals influence each other is that in most settings individuals choose with whom they associate. For example, people choose their spouses, friends, neighbors, etc. In a university context, students often select their roommates, friends and course of study. Therefore, members of a group may behave in a similar manner either because they influence each other (peer effects), or because they "self-select" themselves into that particular group. The inability to distinguish between these possibilities is known in the economics literature as the "selection problem," the "endogenous membership problem" (Moffitt 1998) or the "correlated effects" problem (Manski 1993). With notable exceptions (Ludwig et al., 2001; Katz et al., 2001; Evans et al., 1992; Levy and Kremer, 2002), most of the previous literature has failed to address the selection problem convincingly.

We address the selection problem by taking advantage of a natural experiment in which college students are randomly assigned to roommates through a lottery system. By comparing white students who are randomly assigned minority roommates with white student assigned white roommates, we are able to assess the extent to which racially-diverse settings change the way whites think and act.

We organize our paper as follows: Section II provides the background for our study; Section III describes the data and measures used in our analysis; Section IV details our preliminary results; and a summary and discussion appear in Section V.

II. BACKGROUND

Bowen and Bok's (1999) landmark study of affirmative action policies among elite U.S. universities finds academic, labor-market and civic gains for blacks who attend highly selective colleges. The impact of such policies on non-minority students is the subject of this paper. Bowen and Bok (1999) address this issue by using variability in minority enrollment across elite colleges to show that whites attending elite colleges with higher black enrollment are more likely to know two or more blacks several years beyond the completion of their undergraduate education. They show that this association is not driven by the racial composition of the high schools that the students attended. They argue, but cannot establish empirically, that the many college venues (e.g., sharing rooms or the same residence hall, attending classes, engaging in social activities) in which black and white students

interact provide ample opportunities for establishing interracial friendships. Our data enable us to estimate the impact of racial interactions in room and residence hall venues.

Gurin's (2002) testimony in the University of Michigan's affirmative-action lawsuit outlines the developmental case for positive spillover effects of minority enrollment on white students. She argues that students attending universities find themselves at a crucial time in their development when they experiment with different social roles before making permanent commitments to occupations, social groups, and intimate personal relationships (Newcomb, 1943; Alwin, Cohen, and Newcomb, 1991; Ruble, 1994; King and Shuford, 1996). It is difficult to change the way in which individuals think, given psychological research showing that most people resort to previously learned routines rather than effortful modes of thought when approaching new learning tasks (Langer, 1978; Bargh, 1997). Only when educational institutions provide and support sufficiently novel environments that demand departure from these routines does complex thinking occur. Racial diversity, she argues, is precisely the kind of novelty that encourages students to become conscious learners and critical thinkers (Allport, 1954).

Gurin (2002) supports her arguments with data from analyses of three surveys, two of which draw their samples from nearly 200 colleges and the third of which is a longitudinal study of students attending the University of Michigan. She first establishes that colleges with higher percentage minority enrollments have higher enrollments in ethnic studies courses and more students who report discussing racial/ethnic issues, socializing across racial lines and having close friends in college from other racial backgrounds. She then replicates with her larger sample of universities the Bowen and Bok (1999) finding that students attending colleges with higher minority enrollment are more likely to live and work in racially diverse settings. Next she reports positive correlations between self-reported exposure to ethnic studies classes, diversity of a student's closest friendships, and more general interracial interactions on campus, on the other hand, and a variety of outcomes, including intellectual and academic skills, citizenship engagement and racial/cultural engagement, and post-college interracial interaction patterns in friendships, neighborhoods, and work settings.

Despite attempts to include control variables, studies such as these that rely on naturally occurring variation in cross-university minority enrollment, or on within-university variation in engagement in ethnic-studies courses or racially-diverse social settings, are subject to the criticism that selection bias from still-unmeasured factors is accounting for the observed positive correlations. Such biases could arise if, for example, students predisposed to diversity in their friendships or eventual work settings seek out colleges with higher minority enrollments or, once in college, seek out ethnic studies courses or racially diverse social settings.

The present study addresses these concerns by using data gathered from students whose roommates or residence hall floormates were randomly assigned to them. The great virtue of using such data is that student characteristics are not correlated with the racial composition of their living arrangements. Limitations include an unknown degree of generalizability of our findings beyond the group of students who opt for randomly-assigned roommates and to the impacts of racial diversity in social settings outside the residence hall.

III. DATA, MEASURES AND DESCRIPTIVE STATISTICS

Data

Our data are taken from students entering a large, academically strong, state university in the fall of 1998, 1999 and 2000. In the spring of these years, first-year students mail in housing applications listing four basic housing preferences (smoking/non-smoking room, single/double/triple

occupancy, geographic area of campus, and gender composition of corridor), and whether they want to live in an enrichment residence hall or to request a specific roommate. For some of these preferences, students can list a first, second and third choice.[1] Students who meet the lottery deadline (usually around the end of April) are randomly assigned to their rooms unless they elect to live in an enrichment residence hall, in which case they need to submit an essay to be considered for admission, or they select a specific roommate, in which case the housing office will honor the request as long as it is mutual. Our analysis focuses exclusively on students who were randomly assigned rooms and roommates as part of the lottery process.

For students who meet the lottery deadline, a computer randomly assigns to each of these students a lottery number. The student with lottery number 1 gets assigned first to a room that meets his/her basic housing preferences. Then the student with the next lowest lottery number who has the same housing preferences and gender as student 1 will be assigned as his/her roommate. This process continues until the room is filled. The whole process is repeated subsequently for students with lottery numbers 2, 3 ..., up to the highest lottery number.

As a result, students in the lottery sample are randomly assigned to their rooms and roommates, conditional on gender and the four basic housing preferences. Hence the assignment should be random within cells defined by the combination of gender and basic housing preferences. All of our analyses control for the student's combination of first choices of housing preferences,[2] which amounts to fixed-effects regressions in which the unit of observation is the cell (i.e. combination of values of four housing variables plus gender and cohort). Huber-White methods adjust standard errors for the clustered nature of our roommate data.

We draw our data from several sources. The university's housing office provided us with data on the contents of each student's housing application and on actual occupancy. Race/ethnic, socioeconomic and attitudinal data on students were gathered from the Cooperative Institutional Research Program's (CIRP) Entering Student Survey, an annual survey of the American higher-education system that was started in 1966 by the American Council on Education and is now conducted jointly by the Council and the University of California, Los Angeles. In the case of the particular university in our study, entering students fill in the survey at an orientation session occurring before classes begin.

Outcome measures in our paper are drawn from a survey we administered to students who entered the university in the fall of 1998, 1999, and 2000 and who were randomly assigned roommates.[3] The timing of our survey (winter/spring of 2002) provides us with data when students

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[1] In their housing applications students submit contact information (name, address, telephone number, email, etc.); gender; housing preferences: environment preference (substance-free housing, non-smoking roommate, don't mind roommate smoking, smoker); room type preference (single, double, triple+economy); corridor type preference: all female hall, coed hall/single sex corridor, coed hall/coed corridor; campus area preference: A, B, or C; and other housing preferences: whether want to apply to a learning residence hall (requires separate application process with an essay); whether want to choose a roommate (student must list name of desired roommate).

[2] We would have liked to control for combinations of all three choices but were prevented from doing so by the small numbers of students in the resulting cells of that much larger matrix. In future work we will investigate whether roommate characteristics are random within first-choice and higher-order preferences.

[3] Students entering in 1997 are also being surveyed but their data were still being collected at the time this paper was written.

were more than halfway through their sophomore, junior and senior years. The survey was administered via the internet with a telephone follow-up to maximize response rates. The survey repeated many of the attitudinal and behavior questions asked in the entering student CIRP survey and provides us with our key dependent variables. It also asks about how long the student continued to reside with his or her originally assigned roommates and the nature of their friendship at the time of the survey.

Table 1 shows the size of our sample relative to the size of the entire entering class. Of all entering students in the 1998-2000 cohorts, 89-90% complete the CIRP survey. The 10,268 student respondents to the CIRP are cases in the most comprehensive data file provided to us by the university.

Of the 10, 268 respondents, 2,232 opted to live in enrichment residence halls, 2,029 requested a roommate, 724 lived alone during their first year, 4,134 failed to meet the lottery deadline, 724 requested living alone and 42 otherwise-eligible students were not assigned a roommate. In the end, 1,107 students remained eligible for our lottery sample. The racial characteristics of the 1,107 are also given in Table 1. In all, 918 students designated themselves as "white" and constitute the target sample of white students for the follow-up survey. The follow-up survey response rate was 74% and produced an analysis sample of 682. Missing data on individual survey items reduced this case count further.

The CIRP's questions are wide-ranging and cover student racial/ethnic classification, socioeconomic background (parental education and income); positive (e.g., extracurricular activities during the last year of high school) and problem behavior (drinking, smoking); attitudes toward a wide range of social policies (including affirmative action), goals students have set for themselves; and activities they plan to conduct in the future. Data from the CIRP are used to assign racial/ethnic status and characterize socioeconomic backgrounds of all students and their roommates in our sample. We also use CIRP data on affirmative-action and other attitudes as baseline controls in our estimates of the effects of roommate assignment on subsequently measured affirmative action and other attitudes.

For each student in our sample, the roommate variables were determined by averaging over all roommates. Given that 78% of students in our sample only had one roommate, sample sizes were too small to examine whether the average is better than other measures (such as the minimum or maximum) at capturing the relevant roommate information. We also constructed floormate variables by averaging responses across all individuals other than the given sample individual and his or her roommates who initially lived on the same residence hall floor.

Finally, when we use the term "roommate" and "floormate" we are referring to the roommate(s) or floormates *initially* assigned to the student when entering the university. If a student changed roommates or residence hall floors, we do not use the information on the new roommates or floormates because this would raise the possibility of self-selection and possibly bias our results.[4] The university does not allow roommate changes during the first six weeks of classes (except for extreme cases such as those involving violence), and strongly discourages any roommate changes during the first year.[5] According to housing officers, less than 5% of students switch roommates during their first year.

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[4] For example, one may expect that a student usually would switch to a roommate who is more similar /compatible than the initial roommate. If this is the case, and we used actual roommate (instead of initial roommate) information in our regressions, our peer-effect estimates could reflect self-selection.

[5] It turns out, according to some students at this university, that different dorms and floor counselors have different philosophies about allowing roommate changes instead of resorting to conflict resolution and other methods. Information on this is not systematic enough to exploit in our empirical work.

Methodological issues

A first concern is that randomly assigned roommates may have interacted prior to filling out the entering student CIRP, which may have influenced their survey responses. In fact, most students meet their roommates shortly before classes start. However, some students may meet their roommates at the beginning of orientation (before filling in the survey) and some may have spoken with the roommate on the phone before arriving at the university. According to housing officers, if roommates met before filling in the CIRP survey their first meeting is likely to have occurred only a short time before.

A second concern is whether the lottery process indeed randomly assigns roommates. To verify that the housing assignment process was indeed random within cells, we first spoke with housing officers to understand how the assignment process worked and to understand the computer software used to make the assignments. We then reviewed the documentation of the computer software used to make the assignments for the 1997 and 1998 entering cohorts and checked that it truly randomized within cells. In Kremer and Levy (2002), we verified that initial roommates' background characteristics were not significantly correlated by running regressions in which student background characteristics (such as admissions test score, high school GPA, parental background, high school activities, goals, views, etc.) were regressed on their initial roommates' average and a set of housing preference cell dummies. Here again, our analysis was conducted on the 1997 and 1998 entering cohorts.

Given that the error terms in the regressions described above may not be normally distributed, we assessed significance by comparing the coefficient from running the regression on the actual data to the distribution of coefficients obtained from regressions run on 1,000 simulated samples. In each simulated sample, we matched each reference student with a randomly chosen roommate from the pool of roommates originally matched to reference students in the cell. We checked for correlation in 151 variables. Ten out of 151 regression coefficients turned out significant for the lottery sample, out of which seven had a positive sign and three had a negative sign. The distributions of the coefficients and the t-statistics obtained from the simulations are approximately normal. Our test that compares the regression results using the actual data with the simulated distributions shows that 141 variables fall within the 2.5 and 97.5 percentiles and 10 variables are out in the 5% tail of the distribution. If roommates were indeed assigned randomly and the 151 characteristics were independent, then a calculation using the binomial theorem shows that we should expect 10 or more variables to be in the 5% tail with probability 22.5%. For plausible degrees of correlation, the probability would be even greater.

The test we employed has reasonable power. In the "roommate request" sample, 52 of 151 coefficients are in the 5% tail. In a set of artificial data where the top 10% of students in each cell in the reference sample and the roommate sample were matched together and the remaining 80% were randomly matched, 18 out of 151 coefficients were in the 5% tail of the simulated distribution. (If characteristics were independent, 18 or more tail events would be expected to occur with probability 0.0006.)

A third methodological concern relates to external validity – do results from the relatively small numbers of students who met all of our study criteria generalize to the larger student population and even to the much larger population of all university students? Differences between students who met the lottery deadline and did not request roommates and the rest of the students in the university should not bias our estimates of peer effects within the lottery sample but may make it difficult to generalize our results to the larger university population. Below we compare the demographic characteristics and entering-student CIRP survey attitudes between the two groups and find few differences. This encourages us to think that our results may indeed generalize, although we can imagine many scenarios

in which this would not be the case. One such scenario is if the 2,029 students who requested roommates or the 724 students who requested living alone were more introverted and less open to the influences of new social situations. In that case, our estimates of impacts of racially diverse roommates might overstate the influence of socially diverse college experiences. On the other hand, suppose that the 2,232 students opting for living in enrichment residence halls chose to do so because they are seeking out stimulating college experiences. Our estimates of impacts of racially diverse roommates might understate the influence of socially diverse college experiences for them.

Measures

Key outcome measures, all of which are drawn from our survey of students in the midst of their sophomore to senior years, are attitudes toward affirmative action. The questions ask for strong agreement (coded 4), agreement (3), disagreement (2), or strong disagreement (1) with the following statements: "Affirmative action in college admission should be abolished," "Affirmative action is justified if it ensures a diverse student body on college campuses," and "Having a diverse student body is essential for high quality education."[6] The first of these items was also asked with identical wording on the 1999 and 2000 entering-student CIRP survey, but was not included in the CIRP survey administered to the 1998 entering students.

To see whether roommate impacts extended to other types of social attitudes, we included as an outcome student endorsement of "Wealthy people should pay more taxes," which was also asked with identical wording on the entering-student CIRP survey. To see if roommate assignment affected behavior, we included responses to a question asking respondents to specify the number of times per month when "I have personal contact with people from other racial/ethnic groups" and "I interact comfortably with people from other racial/ethnic groups," and how often the respondent did "volunteer work." Finally, we also examined responses to endorsement of the imperative of "helping to promote racial understanding."[7] In all cases responses were converted to standardized scores by division by the sample standard deviation and scaled so the positive scores indicated more "liberal" attitudes and behaviors.

As mentioned above, a number of these and related questions were included in the entering-student CIRP survey, so we were able to include baseline controls for responses (also standardized and scaled in a "liberal" direction) to the following statements: i) "Race discrimination is no longer a problem"; ii) "Wealthy people should pay more taxes"; iii) "Colleges should prohibit racist/sexist speech on campus"; and iv) "Affirmative action in college admissions should be abolished."

The entering-student CIRP survey also provided race/ethnicity and socioeconomic-background information on both respondents and their roommates. Race and ethnicity were asked in the single question: "Are you (mark all that apply): White/Caucasian, African American/Black, American Indian, Asian American/Asian, Mexican American/Chicano, Puerto Rican, Other Latino and Other." We coded as "white" respondents who marked only the first category, and coded as "black" respondents who marked only the second category. For our "Hispanic" designation we included respondents who

[6] We explored with factor analysis whether these or any other attitudinal items could be combined into an index, but in no case were the correlations among three items high enough to warrant this.

[7] The responses to this scale consisted of the categories "essential" (coded 4), "very important (3), "somewhat important" (2), and "not important" (1).

gave either Mexican American/Chicano, Puerto Rican, or Other Latino but gave no other response. All respondents marking more than one category fall into our "Other" category.[8]

CIRP measures used as control variables in our regressions include both self and average roommate responses to questions about: i) years of father's education; ii) years of mother's education; iii) family income collapsed to the intervals of <$50,000, $50,000 - $74,999, $75,000 - $149,999 (used as the reference category), $150,000-$199,999, and $200,000 or more; and iii) high-school-grade-point average.

We also controlled for respondents' and roommates' high school test scores. Since some students took only the SAT, others took only the ACT, and some took both, a common admissions test score measure was needed as an academic background variable. We therefore standardized test scores using the ACT scale based on concordance tables (published by both ACT, Inc. and the College Board), which are used by many admissions offices around the country (including the one in this study).

We also constructed a handful of floormate measures based on the fraction of floormates (other than the given respondent and his or her immediate roommates) who were: i) black; ii) Asian; iii) Hispanic; iv) "other races"; or v) reported family incomes in excess of $200,000.

Descriptive statistics

Descriptive statistics for outcome and independent variables are shown in Table 2. The first pair of columns presents means and standard deviations of all independent and dependent variables for the analysis sample of 682 whites who responded to the follow-up survey. The second pair presents descriptive statistics from the CIRP survey for the 6842 white students who, for the various reasons listed in Table 1, failed to make it into the random-assignment analysis sample. The third pair of columns repeats this information for the 236 whites who were randomly assigned roommates but failed to respond to the follow-up survey. The final pair of columns repeats this information for the 28 blacks in the random-assignment roommate pool.

The affluent nature of the white respondent sample is reflected in the high average levels of paternal (16.4 years) and maternal (15.9 years) education and a very small fraction of students coming from families with incomes under $50,000. As expected, test scores and high school gradepoint averages are high. Most entering students agree that race discrimination is still a problem and do not think that affirmative action policies should be abolished. Attitudes toward redistributive taxation fall in the middle of the scale. Since these same respondents are often roommates of other respondents, it is hardly surprising that the descriptive statistics for the roommates' data are very similar to those of the respondents. Descriptive data on the racial and ethnic composition of the roommates of this sample of white respondents show relative few nonwhites. In all, only 21 of the 682 white respondents were randomly assigned black roommates. Corresponding numbers assigned Asian, Hispanic or other race roommates are 45, 21, and 30. This greatly limits the precision of our estimates of roommate impacts, although it should not bias the estimates.

As shown by the descriptive statistics for our dependent variables, when students were reinterviewed in our web-based survey, their attitudes had become somewhat more liberal. Cross-racial/ethnic contact and comfort levels are quite high.

[8] Some 94 percent of students choosing "African American/Black" gave it as their only response.

Despite the considerable statistical power, a comparison of white follow-up survey respondents with the much larger sample of white students who failed to meet the lottery criteria reveals few statistically significant differences. Respondents had a slightly higher high school GPA (3.79 vs. 3.77) and were less likely to come from very high-income families (12.8% vs. 17.2%).

Among the white lottery sample, the comparison of the follow-up survey respondents and nonrespondents reveals some potentially troublesome differences. Respondents come from lower-income and less educated parental families, have somewhat higher test scores and high school grades, are less likely to endorse the affirmative action item and somewhat more likely to endorse taxing the rich. We intent to conduct a variety of sensitivity tests to see if our key regression results are sensitive to weighting and other nonresponse bias adjustment procedures.

The final comparison is between white respondents and black students in the random-assignment roommate pool. Perhaps surprisingly, there are no significant socioeconomic differences between the two groups. However, test scores and high school grade-point averages are more than a standard deviation higher for whites than blacks. There is a large difference in endorsing affirmative action policies, with blacks more than two standard deviations more likely than whites to endorse such policies.

Duration of friendships

The follow-up survey asked respondents how long they had lived with their roommates, how often they socialized with their initial roommates both during the first year and in the twelve months prior to the follow-up survey, and how friendly they still are with their initial roommates. Unfortunately, these questions were not asked for each specific randomly-assigned roommate, so it was necessary to restrict the sample of white students from the 682 who responded to the follow-up survey to the 613 white students who had only one roommate. The vast majority (86%) had white roommates; 11 had black roommates, 39 had Asian roommates, 16 had Hispanic roommates and 22 had "other" race roommates.

We tested for statistically significant differences in frequency of subsequent interactions with roommates according to the race of roommates and found none. For example, 10% of whites with white roommates but 18% of whites with black roommates considered these roommates to be their "best college friend." Equal fractions (36% and 38%, respectively) were either "not in touch" or "did not get along" with these roommates. Roughly equal fractions (19% and 18%) had socialized more than once a week with their first-year roommates in the past year, while 57% and 46% had socialized more than once a week with their initial roommates during their first year. Keeping in mind the low power for this analysis, there did not appear to be appreciable differences in the duration or nature of friendships white students struck with white and black roommates.

IV. RESULTS

Attitude correlations

Table 3 provides correlations and sample sizes for white respondents' and their roommates' endorsement of affirmative action and redistributive taxation policies in the entering student CIRP and our follow-up survey.[9] Keep in mind that the scaling of the affirmative action item is reversed so that more positive scores indicate stronger endorsement of such policies.

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[9] These are the only two questions about social issues that were asked identically in both surveys. As explained above, the affirmative action question was not asked on the entering-student CIRP survey for the 1998 cohort, which accounts for the lower case counts for correlations involving that measure.

A first noteworthy and somewhat reassuring feature of this table is that correlations between first-year students and their randomly-assigned roommates are small (-.06 for the affirmative action item and +.09 for the redistributive taxation item). The first of these correlations is statistically insignificant, while the second is significant at the .05 level.

Second, comparable correlations when these first-year students and their roommates have become upperclassmen are only slightly larger (+.14 for the affirmative action item and +.10 for the redistributive taxation item), suggesting a modest scope for mutual first-year-roommate-based peer influences on attitudes.

Third, correlations between follow-up survey responses and roommates' initial attitudes are quite low (+.01 for the affirmative action item and +.06 for the redistributive taxation item), indicating a modest scope for attitudes of upperclassmen being influenced by the initial attitudes of their first-year roommates.

Turning from student/roommate to cross-time, within-individual correlations, Table 3 also shows considerable stability in these two attitudes across time. Responses to the affirmative action item are correlated +.37 across time, while responses to the redistribution item have a +.53 cross-time correlation.[10] This suggests that introducing controls for an individual's CIRP-based prior attitudes will help adjust for unobservables in our estimates of peer effects on attitudes measured later in college. Finally, the two attitudes appear to become more correlated with one another during college. The within-individual correlation between the two items increases from +.12 in the entering-student CIRP to +.37 in the follow-up survey.

Affirmative action attitudes

Table 4 summarizes our regression results. Each column constitutes a separate regression in which the given dependent variable is regressed on the set of respondent, roommate and floormate measures listed in the rows of the table.

The results for the follow-up survey affirmative action attitudes are striking. In all three cases, endorsement of these affirmative action items was half to two-thirds of standard deviation higher among whites who were randomly assigned black roommates than among whites not assigned black roommates. Despite the relatively low statistical power of the sample, all three of these effects were statistically significant at $p<.06$.[11] There is also some evidence that greater numbers of black floormates (who are not also roommates) are associated with more liberal attitudes toward affirmative actions policies. The black floormate effect was statistically significant in the case of responses to "affirmative action is justified if it ensures a diverse student body on college campuses" and positive but statistically insignificant for the other two models.[12]

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[10] Corresponding within-individual, cross-time roommate correlations are +.48 and +.52. These are largely based on the same underlying data as the +.37 and +.53 correlations but are averaged across roommates sharing the same first-year residence hall rooms. Also, non-white roommates contribute data to the roommate correlations.

[11] The p level of the second item was .055.

[12] We also estimated "threshold" models in which the floormate measure was whether there were <u>any</u> blacks on the floor. In two cases the relevant coefficient exceeded its standard error, but in no case was it statistically significant.

No other roommate or floormate characteristic was a consistently significant predictor of affirmative-action attitudes. Roommate high-school-grade-point average was a marginally significant (negative) predictor in the first but not the subsequent two models.

Not unexpectedly, the respondent's own prior responses to affirmative action and income redistribution questions in the entering-student CIRP questionnaire were significant predictors of affirmative action responses 1½ to 3½ years later. The respondent's own test scores had an inconsistently negative impact on current affirmative action attitudes, while maternal schooling had an inconsistently positive association with them.

Other attitudes and behaviors

To see whether black roommates influenced other kinds of social attitudes, we estimated models of agreement or disagreement with the statement "Wealthy people should pay more taxes." The black roommate coefficient was close to statistical significance. Greater numbers of black floormates produced a marginally significant positive impact on whites' attitudes toward income redistribution.

Much more consistently predictive of attitudes toward redistribution was whether either the respondent or his or her roommates came from wealthy families.[13] Respondents from families with annual incomes of $200,000 or more were nearly half a standard deviation less likely to endorse redistributive taxation, while respondents with at least one roommate with such an advantaged background were about one-third standard deviation less likely to do so. Interestingly, there were almost no differences across respondents in other family income categories.[14]

We also estimated the impact of racially diverse peers on the frequency with which white respondents to the follow-up survey "interacted comfortably with" and "had personal contact with" people from other racial/ethnic groups. Regression models using these as dependent variables are given in the fifth and sixth pair of columns in Table 4. Coefficients were sizable for all roommate categories other than Hispanic and significant in the case of multi-racial roommates for both outcomes and significant for Asian roommates for the "interact comfortably" item.[15] The pattern of coefficients on the floormate composition variables is generally positive for Asian and multi-racial roommates but negative for black roommates.

The follow-up survey also contained a question on the personal imperative of "helping to promote racial understanding." Having a black roommate had no substantial association with these responses. Similar null results (not shown in Table 4) were found in the case of imperatives regarding "helping others who are in difficulty," "working to eliminate discrimination against people of color," "participating in a community action group," "participating actively in civil rights organizations," "helping to promote racial understanding," "keeping up to date with political affairs," and "becoming a community leader."

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[13] We also estimated models of agreement with the statements "social and economic differences in this country are justified," "a person's racial background plays only a small role in his/her personal development," and "what one can achieve in life depends mainly upon one's family background." In no case was having a black roommate a significant predictor.

[14] Recall that there were very few instances where either respondents or their roommates had truly low incomes (e.g. below or near the poverty line).

[15] In the case of interacting comfortably with people from other racial/ethnic groups, a dummy variable representing any minority roommate attains statistical significance (coefficient of .311 with a standard error of .132).

Finally, the follow-up survey also asked about a set of behaviors that might conceivably be affected by roommate demographic characteristics. Table 4 shows that although having a black roommate appeared to have no impact on reports of volunteer work, there is suggestive evidence that having a low-income roommate increases such work. Not shown in Table 4 are comparable regression results for the frequency of "reading the editorial page in the daily newspaper," "voted in a student election" and "tutored another student." In the first and third of these regressions the coefficient on the low-income category was positive and exceeded its standard error, but was not statistically significant at conventional levels. There were no consistent patterns of coefficients across the race/ethnic roommate and floormate measures.

Extensions

Although the power was not very high, we estimated separate models for male and female respondents and failed to find significant differences in the coefficients on the key roommate characteristic variables.

Given the much stronger endorsement of affirmative action policies among black than white first-year students, it is possible that the apparent race-of-roommate effect on whites' endorsement of affirmative action policies in the follow-up survey results from merely having been assigned roommates with more positive affirmative action attitudes. Given the low correlations noted earlier between follow-up survey attitudes and initial roommates attitudes, this possibility seemed unlikely. Nevertheless, we tested for it by including in the first three regressions measures of initially-assigned roommates' CIRP-based attitudes on affirmative action and taxing the rich. The key coefficients on roommates' race increased slightly in size and remained statistically significant, indicating that initial roommates' attitudes are not accounting for the race-of-roommate effect.

V. SUMMARY AND DISCUSSION

This paper assesses the magnitude of peer effects in the context of living arrangements at a large state university. It addresses an important methodological problem—self selection—present in most of the existing literature by exploiting a natural experiment in which people are randomly assigned to their peers. We find that white students with black roommates express more positive attitudes regarding affirmative action policies 2-4 years after college entry than white students assigned white roommates. In contrast, whites' redistributive attitudes (taxing the rich) do not appear to be affected by the racial/ethnic composition of roommates but are less favorably inclined toward redistributive policies when whites are assigned roommates from wealthy families. Roommate characteristics had less certain effects on behaviors. There was some evidence that roommates with various racial and ethnic backgrounds influenced whites' subsequent contact and comfort levels with people from other racial/ethnic groups, as well as suggestive evidence that whites with lower-income roommates are more likely to engage in volunteer work.

One story that is consistent with these results is that students become more sympathetic to the social groups to which roommates belong, with racial attitudes most closely associated with roommates' race and income redistribution attitudes most closely associated with roommates' income. Such sympathy appears to have its largest (i.e., half-standard-deviation) effects on a student's attitudes, although there was also some evidence of impacts on behaviors. In the case of minority roommates, the biggest impacts were on "practical" attitudes regarding affirmative action policies and the smallest on values such as a willingness to endorse imperatives of working to eliminate discrimination, help to promote racial understanding, etc.

The debate over affirmative action policies has produced two polarized positions. In the first, it is argued that admitting more minority applicants than is warranted by their test scores reinforces racial stereotypes and ultimately hurts minorities. In the second, the presence of more minority students promotes racial tolerance, stimulates critical thinking and promotes learning. Within residence hall rooms and, to a lesser extent, on residence hall floors, it appears that the presence of racial minorities, despite their lower high school test scores and grades, indeed promotes whites' sympathetic attitudes regarding and interaction with those minorities.

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